

FOREST CONTROL

by

CONTINUOUS INVENTORY

"Today I have grown taller from walking
with the trees."

...Karle Wilson

Milwaukee, Wis. October, 1959 No. 67

WASTE NOT - WANT NOT

It is the elimination and utilization of waste; waste effort, waste time and material, the minimizing of destruction and damage, wear and tear, that produce the great results of the industrial world. There is no magic in these accomplishments. The leaders in action or thought are not magicians, but steady, persistent workers.

Theodore N. Vail

1845 - 1920

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THERE IS MUCH TO LEARN ABOUT CULL IN STANDING TIMBER

Many forms of wastefulness are occurring continuously in this world. Among them foresters must not forget to include the waste of growing space in a forest with many living cull trees. Examples of this are numerous in the CFI records.

Last month the IBM listings for a forest of 407,666 acres in northern Minnesota revealed an astounding total of 3,134,000 cull trees, all living and growing on soil space which should be better used. In this otherwise fine forest there are 299,000 cords of cull trees. They occupy roughly 33,000 acres, or 8% of the total forest area.

REMOVING CULL FROM THE FOREST

Cull trees are a constant menace to the health of any woods. To expedite their removal it is necessary first of all to establish a plan to this end. After this has been done there are three realistic steps to the actual control of the cull tree problem:

1. Be sure to log the stands of poorest condition first.
2. Never fail to cut all culls not needed for den trees.
3. Utilize diseased trees at the earliest opportunity.

These proposals require some technical knowledge and considerable practical information on the common tree rots. Foresters must learn to know the serious tree diseases and how to detect them in the woods. They must learn to know the rate of spread of rots in the many kinds of trees and how to deduct for both mill and woods losses in the scale of trees which are diseased, although still usable.

DEDUCTING WOODS AND MILL CULL IN USABLE TREES

While it is important to cut the forest so that most of the cull trees are removed, it is even more important to cut and use potential culls before they become complete culls.

The decision on the amount of cull deduction for such trees is made by the cruiser in the woods and recorded on each individual tree tally card. There are three broad steps to a sound deduction of mill and woods cull:

1. Deduct for major rots in the butt-off of the tree.
2. Determine the usable length of the tree above the stump.
3. Deduct for major and minor rots above the butt-off.

DEDUCTING FOR WOODS AND MILL CULL IN THE BUTT-OFF

Butt rot is eliminated from the gross scale of standing trees with the aid of a cull deduction chart. This chart enables the cruiser to read

directly the percent of sound wood remaining in the tree after the cull has been deducted. This soundness percentage is a direct multiplying factor for use in the IBM machines. There are five successive steps to be followed in deducting woods and mill cull in the butt-off:

Five Steps for Butt-Off Cull Deduction

1. Identify the rot or disease present in the butt.
2. Examine all four faces of the bole and lightly sound each to determine the extent of the rot.
3. Decide upon the length of the butt-off. This should correspond to the waste section which the cutter leaves in the woods under normal utilization practices.
4. Determine the usable length of the tree above the stump.
5. Look up the soundness factor for the tree in the cull deduction chart.

Tree soundness problem Figure No. 1 shows the procedure for making a typical butt-off cull deduction.

DEDUCTING FOR WOODS AND MILL CULL ABOVE THE BUTT-OFF

Cull or rot above the butt-off is eliminated from the gross scale of standing trees by the application of the principles proposed in Station Paper No. 3 by the Lake States Forest Experiment Station. These principles involve the classification of major and minor culls and require their definition.

DEFINITIONS OF MAJOR AND MINOR CULLS

MAJOR CULLS include heart rots of many kinds, and the larger sap rots and cankers in the butt log. Spiral and rolled seams of considerable length and depth, especially in the lower bole, are also included. Combinations of many minor defects, or of minors and majors, can make one or more major defects.

Each major deductible defect or equivalent contributes a cull of 14%.

MINOR CULLS include small sap rots, tight, straight seams and cracks on the bole when they are not too numerous, moderate sweep and crook, small holes, unsound burls, ingrown bark, and moderate limb stubs and rot pockets. Minor culls tend to become majors as they increase in number and size and group themselves in the lower section of the trunk.

Minor defects, singly or in groups, contribute culls of either 3% or 7%.

SPECIAL CONSIDERATIONS IN CULL DEDUCTION

It should be obvious that the deduction for cull varies somewhat with the product cut. Sweep and crook are seldom given much weight in making pulpwood cull deductions since the wood is cut into short lengths, but cull percentages average higher for sawlog trees.

Cull or rot in the top bolt of the tree is never eliminated on a percentage basis but only by shortening the usable length of the tree. Top cull is always cut out in this way, except for the small remnant of rot extending into the top bolt utilized. This rot is deducted either as a minor or major cull depending upon its origin and extent within the bolt.

It should be understood that percentage deductions for rot are confined to the utilizable portion of the bole. Rot in the far upper crown does not influence the deduction for cull unless it extends into the usable part of the trunk.

FOUR STEPS FOR CULL DEDUCTION ABOVE THE BUTT-OFF

1. Identify the rot or disease present above the butt-off.
2. Determine the usable length of the tree above the stump.
3. Total the cull percent deductions for major and minor culls.
4. Subtract this total from 100 to obtain the soundness factor for the tree. Round this off to the nearest soundness class.

There are six standard classes:

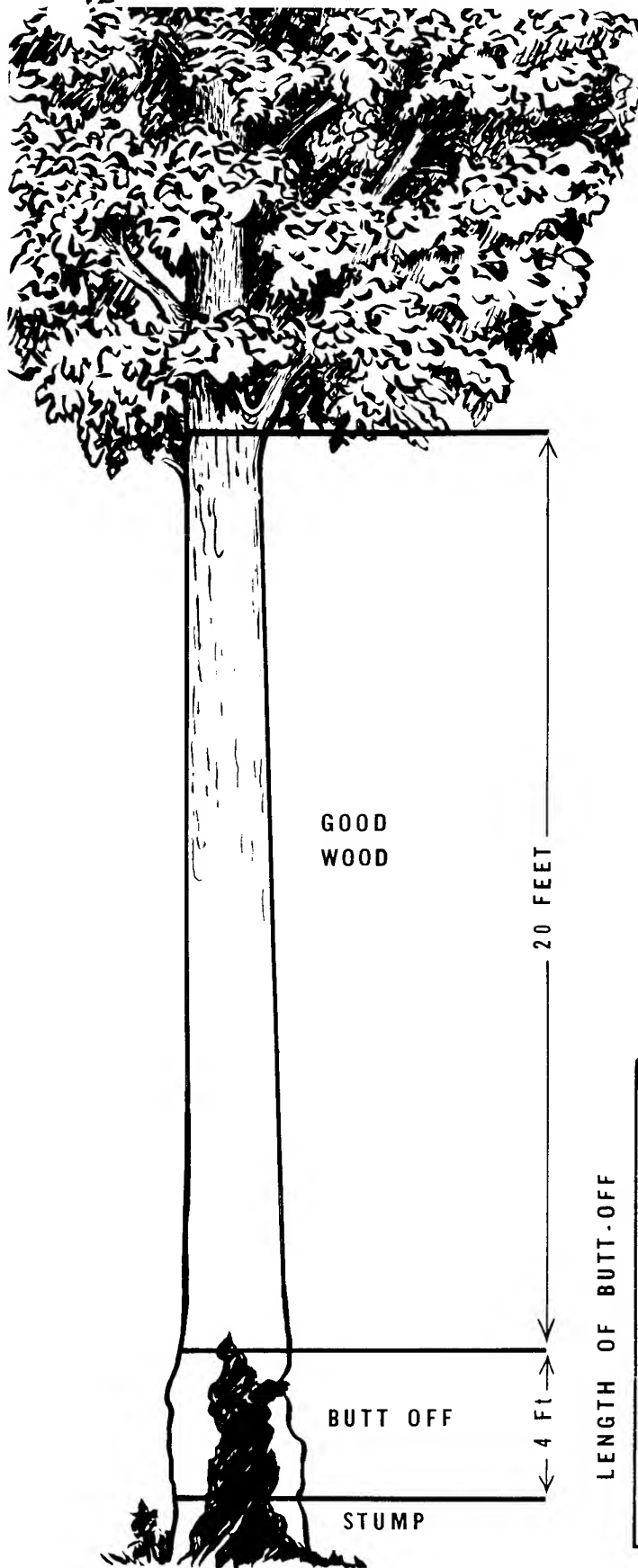
<u>SOUNDNESS CLASS DESCRIPTION</u>	<u>SOUNDNESS %</u>
1. One or more minor culls	97
2. Several large minor culls	93
3. One major cull	86
4. One or more large major culls	78
5. Several large major culls	65
6. Cull trees less than 50% sound	100

Cull tree soundness class No. 6 is commonly coded 100. This factor, when multiplied by the gross scale of the tree in the regular machine process, gives a gross scale for the cull trees.

Tree soundness problem Figure No. 2 and Figure No. 3 give the procedure for making cull deductions above the butt-off and for combinations of butt-off and upper bole cull deductions.

CAL STOTT,
Forester

TREE SOUNDNESS PROBLEM NO. 1



WHITE ROT IN THE BUTT OF SUGAR MAPLE

DBH ----- 18"

Sawlog length ----- 24'

CALCULATING THE GROSS SCALE *

$$28.16 + (6.55 \times 24') = 185.4 \text{ bd. ft.}$$

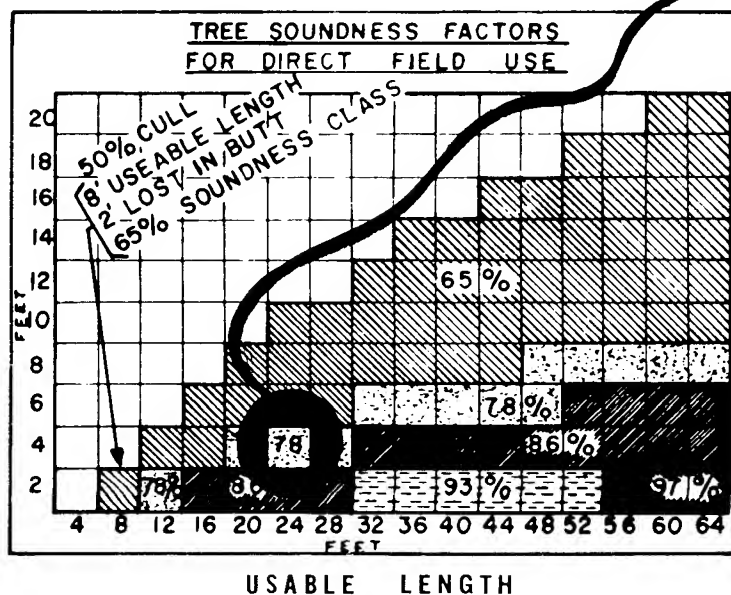
DESCRIPTION OF ROT

Fomes connatus - White rot

Slight butt swell and roughness present. A cluster of small, leathery, whitish conks on the top surfaces of which fern-like mosses grow. The tree is vigorous and there are no other conks or defects.

CALCULATING THE NET SCALE

Close observation and light sounding indicate an approximate 4-foot butt-off. There are no other minor or major culls. The sound scale remaining in the 24-foot length is therefore only 78%. The net scale is $185.4 \times .78 = 144.6$ board feet.



* See Newsletter No. 54

TREE SOUND

Poor Short Crown

TOP ROT

SCAR

GOOD WOOD

ANTS

BUTT OFF

STUMP

50 FEET

6 Ft

DBH ----- 10"
Cordwood length ----- 56'

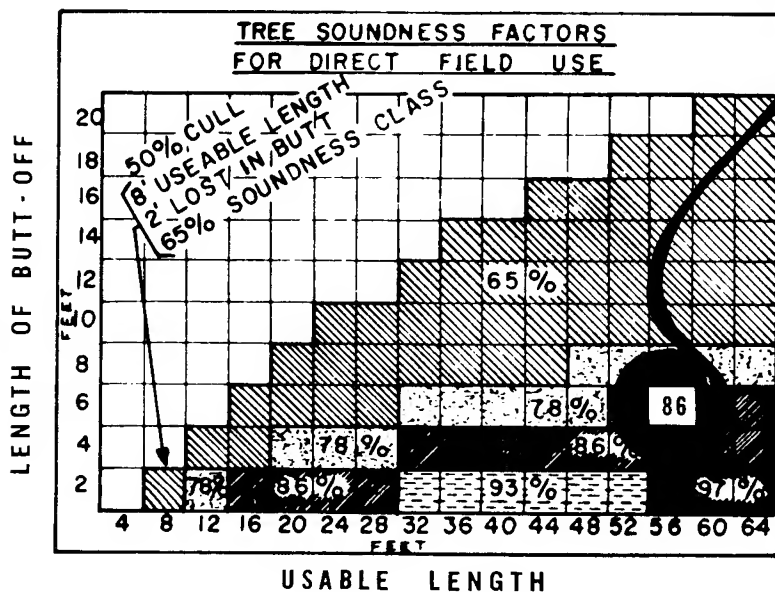
$$2.018 + (.26179 \times 56') = .211 \text{ cords}$$

Polyporus balsameus and Stereum sanguinolentum

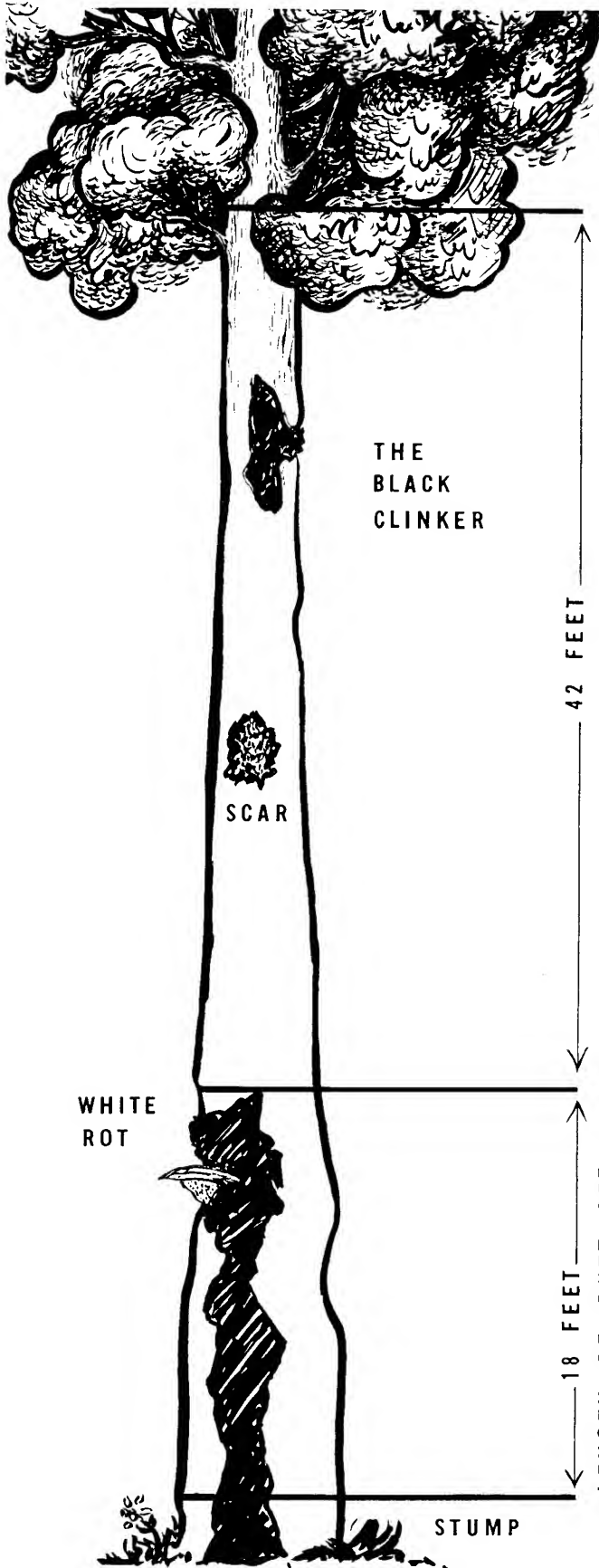
The tree is old and of low vigor. The butt shows a slight swelling, and sounding with a small axe clearly indicates rot. The annual conks of red heart rot abound on the down trees in the immediate forest area and it is assumed to be present in the top of the problem tree. Carpenter ant holes and scars give evidence of added wood loss.

The cruiser estimated the butt-off at 6 feet. The sound scale remaining is therefore 86%. Top rot occurs in the upper end of the bole and another major cull deduction of 14% was made for this to cover the cull in the usable portion. Scars and carpenter ants contribute another 7% wood loss.

The net scale is $[\text{.86} - (.14 + .07)] = .65\%$,
or $(.211 \text{ cords} \times .65) = .137 \text{ cords}$.



TREE SOUNDNESS PROBLEM NO. 3



WHITE ROT IN YELLOW BIRCH

DBH ----- 22"

Sawlog length ----- 60'

CALCULATING THE GROSS SCALE *

$$51.71 + (9.71 \times 60') = 634.3 \text{ bd. ft.}$$

DESCRIPTION OF ROT

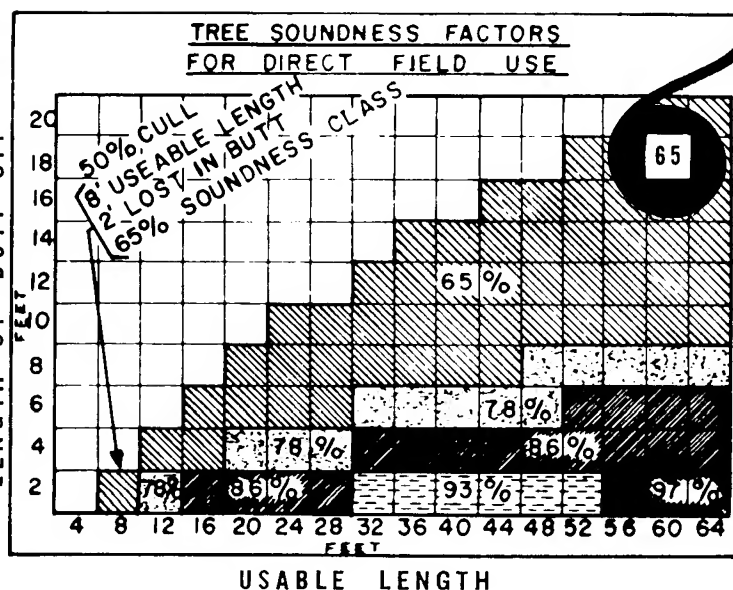
Fomes igniarius and the black clinker

The presence of conks and butt swell and sounding with a small axe indicate butt rot. A small black clinker and a cat face occur on the mid-section of the trunk. The rot appears to be heavy, but is the tree a cull?

CALCULATING THE NET SCALE

The cruiser estimated the butt-off length at 18 feet. The sound scale remaining is only 65%.

An additional major cull and minor scars contribute another 14% and 7% cull. The net scale is $[\cdot 65 - (.14 + .07)] = 44\%$. The tree is therefore less than 50% sound and a cull.



* See Newsletter No. 54